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# The Healthy Eating Index, 1999-2000: Charting Dietary Patterns of Americans

(In alphabetical order)  
P. Peter Basiotis, PhD  
Andrea Carlson, PhD  
Shirley A. Gerrior, PhD, RD  
WenYen Juan, PhD  
Mark Lino, PhD

U.S. Department of Agriculture  
Center for Nutrition Policy and Promotion

To assess and monitor the dietary status of Americans, the U.S. Department of Agriculture's Center for Nutrition Policy and Promotion developed the Healthy Eating Index (HEI). The HEI consists of 10 components, each representing a different aspect of a healthful diet. This article presents the most recent HEI for people 2 years old and over and subgroups of the population. Data from the 1999-2000 National Health and Nutrition Examination Survey are used. Ten percent of the population had a good diet, 16 percent had a poor diet, and the remainder had a diet that needs improvement. Americans need especially to improve their consumption of fruit and milk products. Males age 15 to 18, non-Hispanic Blacks, low-income groups, and those with a high school diploma or less education had lower quality diets. The diets of Americans have not changed since 1996, but they have improved since 1989.

**H**ealthful eating is essential for human development and well-being. In the United States today, some dietary patterns are associated with 4 of the 10 leading causes of death (coronary heart disease, certain types of cancer, stroke, and type 2 diabetes) (U.S. Department of Health and Human Services [DHHS], 2000). A healthful diet, however, can reduce major risk factors for chronic diseases such as obesity, high blood pressure, and high blood cholesterol (USDA & DHHS, 2000). Studies have shown an increase in mortality associated with overweight<sup>1</sup> and obesity resulting from poor eating habits (DHHS, 2001). Thus, major improvements in the health of the American public can be made by improving people's dietary patterns.

To assess Americans' dietary status and to monitor changes in these patterns, the U.S. Department of Agriculture's

(USDA) Center for Nutrition Policy and Promotion (CNPP) developed the Healthy Eating Index (HEI), (Kennedy, Ohls, Carlson, & Fleming, 1995). Relatively new, the HEI had been computed twice, with 1989-90 and with 1994-96 data (USDA, 1995; Bowman, Lino, Gerrior, & Basiotis, 1998), and is a summary measure of the overall quality of people's diets (broadly defined in terms of adequacy, moderation, and variety).

This article presents the HEI for 1999-2000 (Basiotis, Carlson, Gerrior, Juan, & Lino, 2002), which for the first time uses data from the National Health and Nutrition Examination Survey (see box); 1999-2000 is the most recent period for which nationally representative data are available to compute the HEI. The 1999-2000 HEI is calculated for the general population and selected subgroups and is compared with the HEI of earlier years to examine possible trends in the diets of Americans.

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<sup>1</sup>The Healthy Eating Index measures overall diet quality but does not necessarily reflect overconsumption.

## Data Used to Calculate the Healthy Eating Index

The Federal Government's National Health and Nutrition Examination Survey (NHANES) provides information on people's consumption of foods and nutrients, as well as extensive health-related data and information about Americans' demographic and socioeconomic characteristics. NHANES data for 1999-2000—the most recent data available—were used to compute the HEI. Previous HEI estimates were based on data from the Federal Government's Continuing Survey of Food Intakes by Individuals (CSFII) (USDA, 1998).

For the 1999-2000 NHANES, individuals' dietary intakes were collected for 1 day. Prior research has indicated that food intake data based on a 1-day dietary recall are reliable measures of usual intakes by population groups (Basiotis, Welsh, Cronin, Kelsay, & Mertz, 1987). Data were primarily collected through an in-person interview by using the 24-hour dietary recall method. Typically, for children under 6 years old, information was provided by the parent (if the parent was not available, a proxy provided the information); the parent or proxy could also consult with others, such as a day care provider, regarding what the child ate. For children 6 to 11 years old, information was provided by the child, with assistance typically from the parent (again, if the parent was not available, a proxy provided the information). Information about dietary intake for individuals 12 years and older was self-reported.

NHANES 1999-2000 is a complex, multistage probability sample of the U.S. civilian noninstitutionalized population. Individuals of all ages were sampled. The NHANES 1999-2000 sample includes expanded samples of Mexican Americans, African Americans, adolescents 12 to 19 years old, and adults 60 years and older. In 2000, the sample individual selection probabilities were modified to increase the number of sampled persons in low-income, non-Hispanic White population domains. Additionally, screening and sampling rates were adjusted for women of childbearing age to increase the number of pregnant women included in the sample. Statistical weights were used to make the sample representative of the U.S. population.

The HEI was computed for all individuals 2 years and older, because dietary guidelines are applicable to people of these ages only. Pregnant women were excluded from this analysis because of their special dietary needs. The final analytical sample size was 8,070 people.

## Components and Scoring of the Healthy Eating Index

The HEI, representing various aspects of a healthful diet, provides an overall picture of the type and quantity of foods that people eat, their compliance with specific dietary recommendations, and the variety in their diets. The total HEI score is the sum of 10 dietary components:

- Components 1-5 measure the degree to which a person's diet conforms to serving recommendations for the five major food groups of the Food Guide Pyramid: grains (bread, cereal, rice, and pasta), vegetables, fruits, milk (milk, yogurt, and cheese), and meat (meat, poultry, fish, dry beans, eggs, and nuts).
- Component 6 measures total fat consumption as a percentage of total food energy (calorie) intake.
- Component 7 measures saturated fat consumption as a percentage of total food energy intake.
- Component 8 measures total cholesterol intake.
- Component 9 measures total sodium intake.
- Component 10 examines variety in a person's diet.

With each component of the HEI having a maximum score of 10 and a minimum score of 0, the highest possible overall HEI score is 100. Recommendations of the *Dietary Guidelines for Americans* (USDA, 2000), the Food Guide Pyramid (USDA, 1996; Dietary Guidelines Advisory Committee, 2000), the Committee on Diet and Health of the National Research Council (National

**Table 1. Components of the Healthy Eating Index and scoring system**

	Score ranges <sup>1</sup>	Criteria for maximum score of 10	Criteria for minimum score of 0
Grain consumption	0 to 10	6 - 11 servings <sup>2</sup>	0 servings
Vegetable consumption	0 to 10	3 - 5 servings <sup>2</sup>	0 servings
Fruit consumption	0 to 10	2 - 4 servings <sup>2</sup>	0 servings
Milk consumption	0 to 10	2 - 3 servings <sup>2</sup>	0 servings
Meat consumption	0 to 10	2 - 3 servings <sup>2</sup>	0 servings
Total fat intake	0 to 10	30% or less energy from fat	45% or more energy from fat
Saturated fat intake	0 to 10	Less than 10% energy from saturated fat	15% or more energy from saturated fat
Cholesterol intake	0 to 10	300 mg or less	450 mg or more
Sodium intake	0 to 10	2400 mg or less	4800 mg or more
Variety	0 to 10	8 or more different items in a day	3 or fewer different items in a day

<sup>1</sup>People with consumption or intakes between the maximum and minimum ranges or amounts were assigned scores proportionately.

<sup>2</sup>Number of servings depends on Recommended Energy Allowance. All amounts are on a per-day basis.

Research Council, 1989a, 1989b), as well as consultations with nutrition researchers, were the bases used by CNPP to score intake levels. (See table 1 for details on the scoring system.) CNPP assigned a score of 10 when food consumption met the Food Guide Pyramid recommendations; when fat (total and saturated), cholesterol, and sodium intake met the recommendations; or when a person consumed at least half a serving each of 8 or more different foods in a day (variety). A score of 0 was assigned when a person did not consume any item from a Pyramid food group; when intake was greater than the recommendations for fat, cholesterol, and sodium; or when a person consumed at least half a serving of 3 or fewer different foods in a day. All other consumption and intake levels were scored proportionately. With this scoring system, the higher the component scores, the closer consumption or intakes are to the recommended ranges or amounts.

An HEI score over 80 implies that a person has a good diet; a score between 51 and 80, a diet that needs improvement; and a score less than 51, a poor diet.<sup>2</sup> (For more details on how the HEI is computed, see *The Healthy Eating Index: 1999-2000* at [www.cnpp.usda.gov](http://www.cnpp.usda.gov).)

### Healthy Eating Index Overall and Component Scores

During 1999-2000, the mean HEI score for the U.S. population was 63.8; that is, the score indicates that the American diet needs improvement. Ninety percent of Americans had a diet that was poor or needed improvement. Only 10 percent of Americans had a good diet—

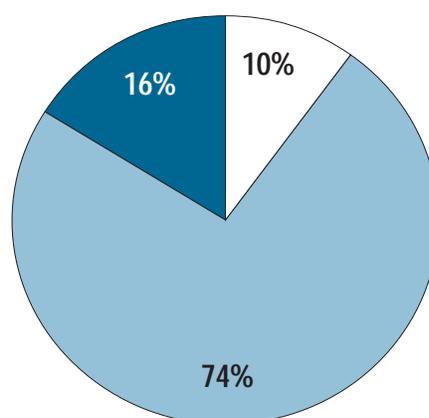
<sup>2</sup>This scoring system was developed in the initial HEI work by Kennedy et al. (1995) in consultation with nutrition experts.

one that mostly met recommendations of the *Dietary Guidelines for Americans*, the Food Guide Pyramid, and other recommendations for healthful eating.

During 1999-2000, the highest mean HEI component scores for the U.S. population were for cholesterol and variety, both averaging 7.7 on a scale of 10 (fig. 2a). With an average score of 6.9, total fat accounted for the next highest component score. People had the two lowest mean scores for the fruits and milk components of the HEI, averaging 3.8 and 5.9, respectively. Average scores for the other HEI components were between 6 and 6.7.

Overall, 69 percent of the U.S. population had a maximum score of 10 for cholesterol—that is, they met the dietary recommendation. Fifty-five percent had a maximum score for variety during 1999-2000 (fig. 2b).

Figure 1. Healthy Eating Index rating, U.S. population, 1999-2000



- Diet classified as "Good" (HEI score greater than 80)
- Diet classified as "Needs improvement" (HEI score between 51 and 80)
- Diet classified as "Poor" (HEI score less than 51)

During 1999-2000, the mean HEI score for the U.S. population was 63.8; that is, the score indicates that the American diet needs improvement.

Less than 50 percent of the population met the dietary recommendations for the other 8 HEI components. Seventeen percent of people consumed the recommended number of servings of fruits per day; 24 to 30 percent met the dietary recommendations for the grains, vegetables, milk, and meat components of the HEI; and 32 to 41 percent met the dietary recommendations for total fat, saturated fat, and sodium. In general, most people could improve all aspects of their diets.

### Healthy Eating Index Scores by Characteristics

HEI scores varied significantly by Americans' demographic and socioeconomic characteristics (table 2).<sup>3</sup>

<sup>3</sup>The demographic and socioeconomic characteristics of people used in this article are different from those used in previous HEI reports. Because the NHANES collected this information in a manner that differs from the CSFII method of collection, the CSFII was used to estimate the previous HEI scores.

(All differences discussed in this section are statistically significant at the 0.05 level.) Females had slightly higher overall scores than did males (64.5 vs. 63.2). Children age 2 to 3 had the highest mean HEI score (75.7) among all children, as well as among all other age/gender groups, and older children had lower HEI scores than did younger children. Children age 2 to 3, compared with older children, also scored significantly higher on several components of the HEI: fruits, vegetables, and sodium. For example, children age 2 to 3 had a mean score of 7.3 for fruits; males age 11 to 14 had a mean score of 2.7. This youngest age group also had a mean score of 6.5 for vegetables, compared with 5.0 for children age 7 to 10. Overall, most age/gender groups had HEI scores in the 61- to 67-point range, and older adults, age 51 and over, had higher HEI scores (65.1 to 66.6) than did other adults (61.3 to 63.2).

Differences in HEI scores by race/ethnicity were apparent. Mexican Americans, for example, had the highest mean HEI score—64.5 for

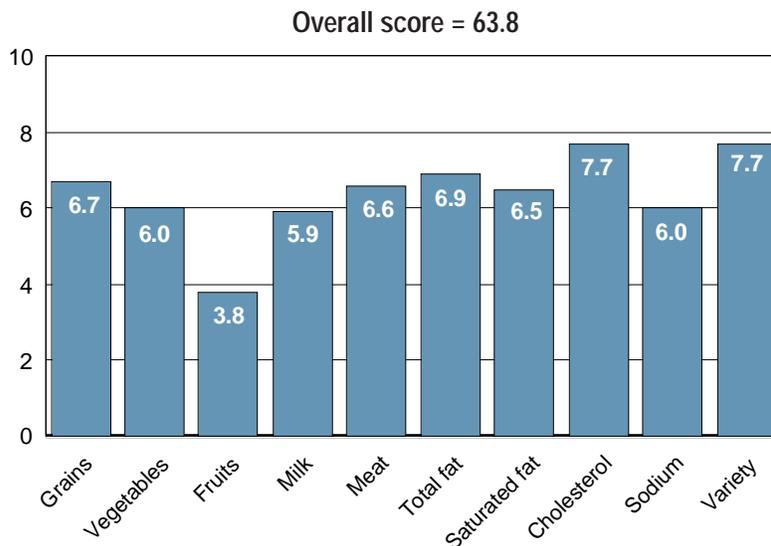
1999-2000. They had significantly higher average scores on the fruits and sodium components of the HEI than was the case for other racial/ethnic groups. While non-Hispanic Whites and other Hispanics had slightly lower overall HEI scores than did Mexican Americans, non-Hispanic Whites had a higher mean overall HEI score than did non-Hispanic Blacks for 1999-2000 (64.2 vs. 61.1). Compared with Whites, Blacks scored significantly lower on the milk and vegetables components of the HEI: an average of 4.5 on the milk and 5.2 on the vegetables components, compared with 6.4 and 6.2 on these two components, respectively, for non-Hispanic Whites. Native-born Americans had a lower quality diet than did members of the U.S. population born in Mexico (63.5 vs. 66).

HEI scores generally increased with levels of education and income. Among adults (age 25 and over) during 1999-2000, those with more than a high school diploma had a higher mean HEI score, compared with those without a high school diploma (65.3 vs. 61.1).

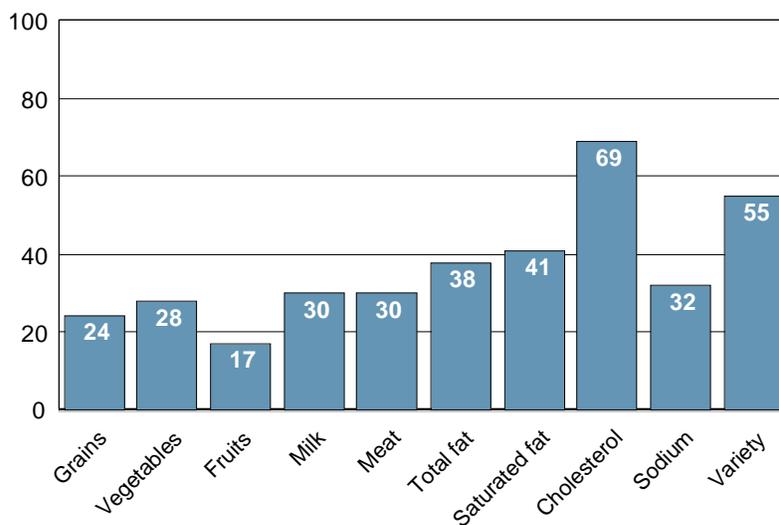
People with household income over 184 percent of the poverty threshold had a higher mean HEI score than did people with household income below the poverty threshold (65 vs. 61.7).<sup>4</sup> People in higher income households had better scores on the grains, vegetables, fruits, milk, meat, and variety components of the HEI than did people in lower income households. People with household income over 184 percent of the poverty threshold had an average variety score of 8.2, while people with household income below the poverty threshold had an average variety score of 7.

<sup>4</sup>In 2000, the poverty threshold was \$11,531 for a family of two, \$13,861 for a family of three, \$17,463 for a family of four, and \$20,550 for a family of five.

**Figure 2a. Healthy Eating Index: Component mean scores, 1999-2000**



**Figure 2b. Percent of people meeting the dietary recommendations for the Healthy Eating Index components, 1999-2000**



**Table 2. Healthy Eating Index, overall and component mean scores, by selected characteristics, 1999-2000**

Characteristic	Overall	Grains	Vegetables	Fruits	Milk	Meat <sup>1</sup>	Total fat	Saturated fat	Cholesterol	Sodium	Variety
<b>Gender</b>											
Male	63.2	6.9	5.9	3.5	6.3	7.2	6.9	6.5	7.1	5.0	8.0
Female	64.5	6.4	6.0	4.1	5.6	6.1	6.9	6.5	8.3	7.0	7.5
<b>Age/gender</b>											
Children, 2-3 <sup>2</sup>	75.7	8.9	6.5	7.3	7.4	6.3	7.8	5.9	8.9	8.3	8.6
Children, 4-6	66.9	7.4	5.0	4.9	7.2	4.9	7.1	5.7	9.1	7.8	7.8
Children, 7-10	66.0	8.0	5.0	3.9	7.7	5.6	7.1	6.0	8.6	6.2	8.0
Females, 11-14	61.4	6.5	5.0	3.6	5.3	5.3	7.0	6.0	8.8	7.0	7.0
Females, 15-18	61.7	6.4	5.6	3.6	4.6	5.3	7.2	6.6	9.0	6.7	6.8
Females, 19-50	63.2	6.1	6.2	3.3	5.5	6.5	6.9	6.6	8.1	6.5	7.5
Females, 51+	66.6	6.4	6.4	5.3	5.3	6.2	6.8	6.7	8.1	7.7	7.7
Males, 11-14	60.8	7.0	4.8	2.7	6.1	5.7	7.3	6.2	8.1	5.9	7.2
Males, 15-18	59.9	7.0	5.1	2.5	6.1	6.8	7.2	6.3	7.0	4.4	7.5
Males, 19-50	61.3	6.6	6.0	2.7	6.1	7.5	6.9	6.6	6.7	4.2	7.9
Males, 51+	65.2	6.7	6.7	4.5	5.9	7.7	6.6	6.7	6.8	5.3	8.4
<b>Race/ethnicity</b>											
Non-Hispanic White	64.2	6.8	6.2	3.7	6.4	6.5	6.7	6.3	7.8	5.8	7.9
Non-Hispanic Black	61.1	6.2	5.2	3.7	4.5	7.0	7.0	6.9	7.4	6.3	7.0
Mexican American	64.5	6.5	5.6	4.1	5.5	6.7	7.3	6.8	7.3	6.8	7.8
Other race <sup>3</sup>	63.4	6.6	5.9	3.8	4.0	6.7	7.5	7.3	8.1	6.3	7.2
Other Hispanic	64.2	6.6	5.4	3.8	5.7	6.6	7.7	7.1	7.8	6.0	7.6
<b>Place of birth</b>											
United States	63.5	6.7	6.0	3.6	6.1	6.6	6.8	6.3	7.7	5.9	7.7
Mexico	66.0	6.4	5.4	4.5	5.2	7.1	7.8	7.6	7.1	7.0	8.0
Other	65.7	6.3	5.8	4.6	5.1	6.6	7.9	7.7	7.8	6.1	7.8
<b>Education<sup>4</sup></b>											
No high school diploma	61.1	6.0	5.5	3.3	4.9	6.9	6.9	6.8	7.2	6.6	7.1
High school diploma	63.0	6.3	6.3	3.7	5.8	7.1	6.6	6.3	7.4	5.7	7.9
More than high school diploma	65.3	6.7	6.7	4.0	6.3	7.0	6.7	6.8	7.5	5.5	8.2
<b>Income as percent of poverty</b>											
<100%	61.7	6.2	5.4	3.5	5.3	6.4	7.1	6.5	7.5	6.8	7.0
100-184%	62.6	6.6	5.6	3.4	5.7	6.3	7.0	6.5	8.0	6.3	7.2
>184%	65.0	6.8	6.3	4.0	6.3	6.7	6.8	6.5	7.7	5.7	8.2

<sup>1</sup>One serving of meat equals 2.5 ounces of lean meat.

<sup>2</sup>Portion sizes were reduced to two-thirds of adult servings except for milk for children age 2-3.

<sup>3</sup>Consists of Asian, Pacific Islander, American Indian, and Alaskan Native.

<sup>4</sup>Consists of people age 25 and over only.

Note: The overall HEI score ranges from 0 to 100. HEI component scores range from 0 to 10. For each subgroup, component scores may not exactly equal the overall score because of rounding.

**Table 3. Trends in the Healthy Eating Index, overall and component mean scores**

	1989	1996	1999-2000
<b>Overall</b>	<b>61.5</b>	<b>63.8</b>	<b>63.8</b>
<b>Components</b>			
Grains	6.1	6.7	6.7
Vegetables	5.9	6.3	6.0
Fruits	3.7	3.8	3.8
Milk	6.2	5.4	5.9
Meat	7.1	6.4	6.6
Total fat	6.3	6.9	6.9
Saturated fat	5.4	6.4	6.5
Cholesterol	7.5	7.9	7.7
Sodium	6.7	6.3	6.0
Variety	6.6	7.6	7.7

Certain segments of the American population had a diet of poorer quality than did other groups. This underscores the need to tailor nutrition policies and programs to meet the needs of different segments of the population, particularly those at a higher risk of having a poor diet.

Based on the demographic and socio-economic characteristics examined, no subgroup of the population had an average HEI score greater than 80—a score that implies a good diet. Certain segments of the American population had a diet of poorer quality than did other groups. This underscores the need to tailor nutrition policies and programs to meet the needs of different segments of the population, particularly those at a higher risk of having a poor diet.

### Trends in the Healthy Eating Index

How has the quality of the American diet changed over time? Our results show that it has improved slightly since 1989, but it has not changed since 1996 (table 3). People’s diets were in the “needs improvement” range during all 3 years the HEI was computed. In 1989, the mean HEI score was 61.5. In 1996 and 1999-2000, it was 63.8—a 4-percent increase from 1989. Saturated fat and variety scores increased steadily over the three periods, and sodium scores decreased steadily. Grains, fruits, and total fat scores increased

from 1989 to 1996 and then remained constant through 1999-2000. Whereas vegetables and cholesterol scores increased from 1989 to 1996 and decreased thereafter, milk and meat scores decreased from 1989 to 1996 and increased thereafter. The steady decrease in the sodium score (as a result of greater sodium intake) may be related to the increase in the grains score: grain products contribute large amounts of dietary sodium to the diet (Saltos & Bowman, 1997). Because of changes since 1989 in how servings of the food groups are calculated, food group scores in 1996 and 1999-2000 may be smaller than they would be if the same method for calculating the 1989 HEI had been used. Hence, the improvement in people’s diets over time is likely greater than what is reported here.

The increase in the HEI from 1989 to 1999-2000 may be due to several factors: the Food Guide Pyramid was introduced, the *Dietary Guidelines for Americans* were revised, and the Nutrition Labeling and Education Act was enacted. These initiatives were aimed at improving the eating habits of Americans. Also, since 1989, many

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people became more aware of the health benefits of a better diet that have been promoted through various campaigns, such as 5 A Day. That the HEI has not improved from 1996 to 1999-2000 highlights the need for continual as well as new nutrition initiatives.

USDA is committed to improving the Nation's nutrition and health by promoting more healthful eating habits and lifestyles and improving access to nutritious foods. USDA will continue to use its "broader nutrition education efforts as key opportunities to promote more healthful eating and physical activity across the Nation" (USDA, 2002, p. 19) and use the HEI as an indicator of healthful dietary patterns.

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## Conclusions

Americans' eating patterns, as measured by the HEI, have improved slightly since 1989 but have not changed from 1996 to 1999-2000. In all three periods, the average HEI score indicated that the diets of most Americans need to improve, and during the latest period, only 10 percent of Americans had a good diet. Of the 10 components of the HEI, cholesterol was the one where the highest percentage (69 percent) of people had a maximum score of 10—that is, they met the dietary recommendation. Fifty-five percent had a maximum score for variety. For the other 8 components of the HEI, only 17 to 41 percent of the population met the dietary recommendations on a given day.

Gender, age, race/ethnicity, place of birth, education, and income are factors that influence diet quality. In general, children less than age 11 had a better diet than did others. Possibly, parents are more attentive to children's diets. Adults over age 50, females, and those with more education and income had a better diet, compared with their counterparts; whereas, non-Hispanic Blacks had a poorer quality diet than did other racial/ethnic groups. The average HEI score of people by selected characteristics, however, still indicated that Americans' diets need to improve.

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<sup>5</sup>Link updated June 2004: [www.usda.gov/ocfo/usdasp/pdf/sp2002.pdf](http://www.usda.gov/ocfo/usdasp/pdf/sp2002.pdf).

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